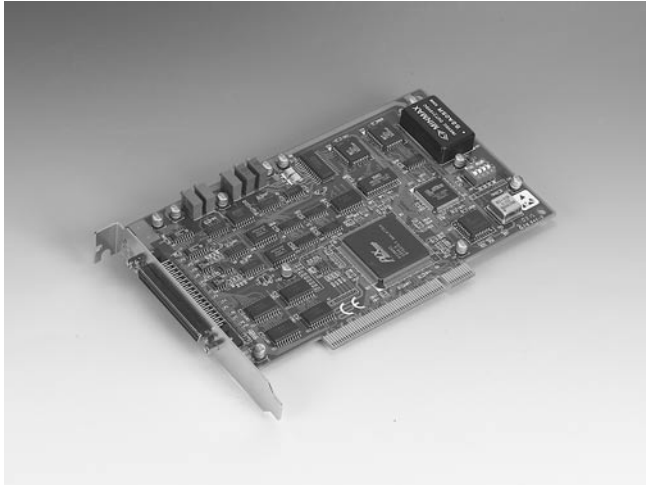


PCI-1710 PCI-1710HG

100 kS/s, 12-bit, PCI-bus
Multifunction Card

100 kS/s, 12-bit, PCI-bus,
High Gain, Multifunction Card



CE

Features

- 16 single-ended, 8 differential or a combination of analog inputs
- 12-bit A/D converter, with up to 100 kHz sampling rate
- Programmable gain for each input channel
- Free combination of single-ended and differential inputs
- On-board 4096 samples FIFO buffer
- Two 12-bit analog output channels
- 16 digital inputs and 16 digital outputs
- Programmable pacer/counter
- BoardID™ Switch
- Short circuit protection

Introduction

The PCI-1710 Series are multifunction cards for the PCI bus. Their advanced circuit design provides higher quality and more functions, including the five most desired measurement and control functions: 12-bit A/D conversion, D/A conversion, digital input, digital output, and counter/timer.

Specifications

Analog Input

- **Channels** 16 single-ended/ 8 differential (SW programmable)
- **Resolution** 12 bits
- **Max. Sampling Rate*** 100 kS/s
- **FIFO Size** 4096 samples
- **Overvoltage Protection** $\pm 30V_p-p$
- **Input Impedance** 1 $G\Omega$
- **Sampling Modes** Software, onboard programmable pacer, or external
- **Input Range** (V, software programmable)

| PCI-1710/1710L | | | | | |
|--|----------|---------|-----------|------------|-------------|
| Bipolar | ± 10 | ± 5 | ± 2.5 | ± 1.25 | ± 0.625 |
| Unipolar | - | 0~10 | 0~5 | 0~2.5 | 0~1.25 |
| Accuracy (% of FSR $\pm 1LSB$) | 0.01 | 0.01 | 0.02 | 0.02 | 0.04 |

| PCI-1710HG/1710HGL | | | | | | | | |
|--|----------|---------|---------|-----------|-----------|------------|------------|-------------|
| Bipolar | ± 10 | ± 5 | ± 1 | ± 0.5 | ± 0.1 | ± 0.05 | ± 0.01 | ± 0.005 |
| Unipolar | - | 0~10 | - | 0~1 | - | 0~0.1 | - | 0~0.01 |
| Accuracy (% of FSR $\pm 1LSB$) | 0.01 | 0.01 | 0.02 | 0.02 | 0.02 | 0.02 | 0.04 | 0.04 |

*Note:

The sampling rate and throughput depends on the computer hardware architecture and software environment. The rates may vary due to programming language, code efficiency, CPU utilization and so on.

Analog Output (PCI-1710/1710HG only)

- **Channels** 2
- **Resolution** 12 bits
- **Output Rate** Static update
- **Output Range** (V, software programmable)

| Internal Reference | Unipolar | 0 ~ +5 V @ -5 V 0 ~ +10 V @ -10 V |
|---------------------------|----------|--|
| External Reference | | 0 ~ +x V @ -x V ($-10 \leq x \leq 10$) |

- **Slew Rate** 10 V/ms
- **Driving Capability** 3 mA
- **Operation Mode** Software polling
- **Accuracy** INLE: $\pm 1/2$ LSB, DNLE: $\pm 1/2$ LSB

Digital Input

- **Channels** 16
- **Compatibility** 5 V/TTL
- **Input Voltage** Logic 0: 0.8 V max.
Logic 1: 2.0 V min.

Digital Output

- **Channels** 16
- **Compatibility** 5 V/TTL
- **Output Voltage** Logic 0: 0.4 V max.
Logic 1: 2.4 V min.
- **Output Capability** Sink: 8.0 mA @ 0.8 V
Source: -0.4 mA @ 2.0 V

Pacer/Counter

- **Channels** 1
- **Resolution** 16 bits
- **Compatibility** 5 V/TTL
- **Max. Input Frequency** 1 MHz

Specifications Continued

General

- **Bus Type** PCI 2.2
- **I/O Connector** 1 x SCSI 68-F
- **Dimensions (L x H)** 175 x 100 mm (6.9" x 3.9")
- **Power Consumption** Typical: 5 V @ 850 mA
Max: 5 V @ 1.0 A
- **Operating Temperature** 0 ~ 60° C (32 ~ 140° F) (refer to IEC 68-2-1, 2)
- **Storing Temperature** -20 ~ 70° C (-4 ~ 158° F)
- **Storing Humidity** 5 ~ 95% RH non-condensing (refer to IEC 68-2-3)

Ordering Information

- **PCI-1710** 100 kS/s, 12-bit Multifunction Card, user's manual and driver CD-ROM. (cable not included)
- **PCI-1710L** 100 kS/s, 12-bit Multifunction Card w/o AO, user's manual and driver CD-ROM. (cable not included)
- **PCI-1710HG** 100 kS/s, 12-bit High-Gain Multifunction Card, user's manual and driver CD-ROM. (cable not included)
- **PCI-1710HGL** 100 kS/s, 12-bit High-Gain Multifunction Card w/o AO, user's manual and driver CD-ROM. (cable not included)
- **PCLD-8710** Industrial Wiring Terminal Board with CJC circuit for DIN-rail mounting (cable not included)
- **PCLD-8710BNC** Industrial Wiring Terminal Board with CJC circuit and BNC connectors for DIN-rail mounting (cable not included)
- **PCL-10168** 68-pin SCSI-II cable with male connectors on both ends and special shielding for noise reduction, 1 m.
- **PCL-10168-2** 68-pin SCSI-II cable with male connectors on both ends and special shielding for noise reduction, 2 m.
- **ADAM-3968** 68-pin SCSI-II Wiring Terminal Board for DIN-rail Mounting Feature Details

Feature Details

PCI-1710 series provide specific functions for different user requirements:

| | |
|-------------|--|
| PCI-1710 | 100 kS/s, 12-bit Multifunction Card |
| PCI-1710L | 100 kS/s, 12-bit Multifunction Card w/o AO |
| PCI-1710HG | 100 kS/s, 12-bit High-Gain Multifunction Card |
| PCI-1710HGL | 100 kS/s, 12-bit High-Gain Multifunction Card w/o AO |

Mixed Single-ended or Differential Analog Inputs

PCI-1710 and PCI-1710HG feature an automatic channel/gain scanning circuit. The circuit, rather than your software, controls multiplexer switching during sampling. The on-board SRAM stores different gain values and configurations for each channel. This design lets you perform multi-channel high-speed sampling (up to 100 KHz) with different gains for each channel and allows free combination of single-ended and differential inputs.

On-board FIFO (First In First Out) Memory

PCI-1710, PCI-1710L, PCI-1710HG and PCI-1710HGL have an on-board FIFO buffer that can store up to 4 K A/D samples. PCI-1710 and PCI-1710HG generate an interrupt when the FIFO is half full. This feature provides continuous high-speed data transfer and more predictable performance on Windows systems.

On-board Programmable Counter

The PCI-1710/1710L/1710HG/1710HGL provides a programmable counter to generate a pacer trigger for the A/D conversion. The counter chip is an 82C54 or equivalent, which includes three 16-bit counters on a 10 MHz clock. One counter is used as an event counter for counting events coming from the input channels. The other two are cascaded together to make a 32-bit timer for a pacer trigger.

Special Shielded Cable for Noise Reduction

The PCL-10168 shielded cable is specially designed for the PCI-1710/1710HG to reduce noise in the analog signal lines. Its wires are all twisted pairs, and the analog lines and digital lines are separately shielded, providing minimal cross talk between signals and great protection against EMI/EMC problems.

Pin Assignments

| | | | |
|-----------|----|----|-----------|
| A10 | 68 | 34 | A11 |
| A12 | 67 | 33 | A13 |
| A14 | 66 | 32 | A15 |
| A16 | 65 | 31 | A17 |
| A18 | 64 | 30 | A19 |
| A110 | 63 | 29 | A111 |
| A112 | 62 | 28 | A113 |
| A114 | 61 | 27 | A115 |
| AIGND | 60 | 26 | AIGND |
| *AO0_REF | 59 | 25 | AO1_REF* |
| *AO0_OUT | 58 | 24 | AO1_OUT* |
| AOGND | 57 | 23 | AOGND |
| D10 | 56 | 22 | D11 |
| D12 | 55 | 21 | D13 |
| D14 | 54 | 20 | D15 |
| D16 | 53 | 19 | D17 |
| D18 | 52 | 18 | D19 |
| D110 | 51 | 17 | D111 |
| D112 | 50 | 16 | D113 |
| D114 | 49 | 15 | D115 |
| DGND | 48 | 14 | DGND |
| DO0 | 47 | 13 | DO1 |
| DO2 | 46 | 12 | DO3 |
| DO4 | 45 | 11 | DO5 |
| DO6 | 44 | 10 | DO7 |
| DO8 | 43 | 9 | DO9 |
| DO10 | 42 | 8 | DO11 |
| DO12 | 41 | 7 | DO13 |
| DO14 | 40 | 6 | DO15 |
| DGND | 39 | 5 | DGND |
| CNT0_CLK | 38 | 4 | PACER_OUT |
| CNT0_OUT | 37 | 3 | TRG_GATE |
| CNT0_GATE | 36 | 2 | EXT_TRG |
| +12V | 35 | 1 | +5V |

*: Pins 23-25 and pins 57-59 are not defined for PCI-1710L/1710HGL